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PREVENTION OF RHEUMATIC FEVER*

Rheumatic Fever is a recurrent disease which can be prevented. It is now generally agreed that both the initial and recurrent attacks of the disease are usually precipitated by infections with beta hemolytic streptococci. Therefore, the prevention of rheumatic fever and rheumatic heart disease depends upon the control of streptococcal illnesses. This may be successfully accomplished by (1) early and adequate treatment of streptococcal infections in all individuals and (2) prevention of streptococcal infections in rheumatic subjects.

TREATMENT OF STREPTOCOCCAL INFECTIONS

In the general population at least 3% of untreated streptococcal infections are followed by rheumatic fever. Among certain individuals, especially those with previous rheumatic fever, the incidence is much higher. Adequate and early penicillin treatment, however, will prevent most attacks of rheumatic fever and eliminate streptococci from the throat.

A. Diagnosis of Streptococcal Infection

In most instances it is possible to recognize streptococcal infections by their clinical manifestations but laboratory tests may assist in establishing the diagnosis.

1. *Epidemiology:* The seasonal pattern and presence of similar cases in the community or household may be helpful. For example, streptococcal infections in the northern United States are most common from January through June. Likewise, a case of scarlet fever in one child would suggest that a sore throat in another has the same etiology.

2. *Symptoms*
   a. Sore throat—onset sudden, in the tonsillar area, not in the trachea.
   b. Headache—common.
   c. Fever — variable — but generally from 101° to 104°.F.
   d. Abdominal pain — common, especially in children. Not too common in adults, but does occur.
   e. Nausea and vomiting — common, especially in children.
   f. These symptoms are usually *not* present:
      (1) Simple coryza
      (2) Cough
      (3) Hoarseness

3. *Signs*
   a. Red throat—frequently beefy red, but if seen early the redness may be mild.
   b. Exudate—usually present.
   c. Glands — swollen, tender tonsillar glands at angle of jaw.
   d. Rash—scarlatiniform (characteristic of scarlet fever—not common).
   e. Discharge—otitis media and sinusitis indicated by (serous or purulent) aural or nasal discharge are frequent complications of streptococcus pharyngitis.

4. *Laboratory*
   a. White blood count—generally over 12,000 and in children frequently over 20,000.
   b. Throat culture—positive for hemolytic streptococci.

5. *Therapeutic Response*

   Almost without exception patients with streptococcal infections are vastly improved within 24 hours

*This statement was prepared by the Committee on Prevention of Rheumatic Fever appointed by the Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association.

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after penicillin has been started and the temperature normal, or nearly so.

This therapeutic response is characteristic and if it does not occur, the chances are much against the disease being due to hemolytic streptococci.

B. Treatment of Streptococcal Infections

In order to be effective, treatment should be started immediately when a streptococcal infection is suspected and continued for sufficient time to eradicate the streptococci from the throat.

Penicillin is the drug of choice for treating streptococcal infections.

Both the oral and the intramuscular routes of administration have been utilized successfully for penicillin therapy of streptococcal infections. Intramuscular injections have been proved to prevent rheumatic fever. The data on the value of oral penicillin as a preventive is less complete.

Oral administration in comparison to intramuscular administration has these advantages:

(1) It is not as distasteful to many patients.

(2) It requires fewer physician visits.

It has these disadvantages:

(1) Larger amounts of penicillin must be used.

(2) It is difficult to administer to vomiting or refractory children.

(3) In some adults it gives rise to persistent diarrhea and pruritus ani.

(4) It is difficult to be sure that treatment is continued for sufficient time and given in proper relation to meals to be effective.

C. Recommended Treatment Schedules

1. *Intramuscular Penicillin.*

a. Children—one intramuscular injection of 300,000 units of procaine penicillin with aluminum monostearate in oil *every third day for three doses.*

b. Adults—one intramuscular injection of 600,000 units procaine penicillin with aluminum monostearate in oil *every third day for three doses.*

(Note: Less preferable, but usually effective—two doses as above at three day intervals.)

2. *Oral Penicillin.*

a. First five days: 200,000 to 300,000 units one half to one hour before meals and at bedtime (total of 800,000 to 1.2 million units per day in 4 divided doses. The lesser amount for children; the greater amount for adults).

b. Second five days: 200,000 to 250,000 units one half to one hour before meals (total 600,000 to 750,000 units per day in 3 divided doses).

(Note: To be effective, therapy should be continued for the entire ten days even though the temperature may return to normal and the patient may feel better within one or two days.)

3. *Combination of Intramuscular and Oral Penicillin.*

Therapy may be begun with one injection of penicillin (300,000 units procaine penicillin with aluminum monostearate in oil) and then, beginning three days after the injection, continued for an additional seven days with oral penicillin according to the schedule 2b outlined above.

4. *Other Medication.*

a. Aureomycin is less effective than penicillin in controlling streptococcal infection but is especially useful in those sensitive to penicillin.

Dosage: Total 10 mg. per pound of body weight in four divided doses daily for two days. Cut dose in half for remaining eight days of therapy.

b. New preparations of penicillin. These may be effective and even preferable to the treatment schedules outlined, but at present they have not had sufficient trial to warrant their recommendation.

c. Other antibiotics: At present there is inadequate data on their value.

5. *Not Recommended for Treatment.*

a. Penicillin troches or lozenges.

b. Penicillin followed by sulfonamides.

c. Sulfonamide drugs.

(Note: Recurrences of streptococcal infection should be treated as primary attacks.)

PREVENTION OF STREPTOCOCCAL INFECTIONS

A. General Rules for Prophylaxis

1. *Who should be treated?*

All individuals under the age of eighteen who have had rheumatic fever or chorea and all those over this age who have had an attack within five years.

2. *When should prophylactic treatment be initiated?*

At the end of the second week of the attack of rheumatic fever or any time thereafter when the patient is first seen.* Prior to the start of prophylaxis, beta hemolytic streptococci should be eradicated by proper treatment of the patient.

(See methods of penicillin therapy recommended above.)

3. *How long should prophylaxis be continued?*

In children, at least to the age of eighteen; in all those above this age, for at least five years from their last attack.

4. *Should prophylaxis be continued during the summer?*

Yes.

B. Prophylactic Methods

1. *Sulfadiazine*

This drug has the advantage of being easy to administer, inexpensive and effective (other newer sulfonamides are probably equally effective). Although resistant streptococci have appeared during mass prophylaxis in the armed forces, this is rare in civilian populations.

a. Dosage—from 0.5 to 1.0 gm. taken each morning throughout the year. The smaller dose is to be used in children under sixty pounds.

b. Toxic Reactions—there are infrequent and are usually minor. However, in any patient being given prophylaxis with sulfonamides consider all rashes and sore throats as possible toxic reactions to the drug, especially if they occur in the first eight weeks of prophylaxis. The chief toxic reactions are:

(1) Skin eruptions

(a) Morbilliform — much like measles—continue drug with caution.

(b) Urticarial — best discontinue treatment.

(c) Scarlatiniform — often associated with sore throat and fever. Unsafe to continue drug.

(2) Blood reactions

Leukopenia — Discontinue if white blood count falls below 4,000 and polynuclear neutrophiles below 35% because of possible agranulocytosis which is often associated with sore throat and a rash. Because of these reactions, weekly white blood counts are advisable for the first two months of prophylaxis. (The use of sulfonamides *therapeutically* for any reason in this period should be preceded by a white blood count). The occurrence of agranulocytosis after eight weks of continuous prophylaxis with sulfonamides is extremely rare.

2. *Penicillin*

Although experience with oral penicillin for the prophylaxis of rheumatic fever is more limited than that with the sulfonamides, the antibiotic promises to be a safe and effective prophylactic agent. Oral penicillin has the desirable characteristics of being bactericidal for hemolytic streptococci and of rarely producing serious toxic reactions. It has the disadvantages of being more costly than sulfadiazine and because of the need of giving it on an empty stomach, of being somewhat more difficult to administer.

Oral penicillin represents an alternative drug for rheumatic fever prophylaxis. It is especially important to use this agent for those who do not tolerate sulfadiazine.

*Note—In patients receiving ACTH or Cortisone, be cautious that other infections are not masked since the prophylactic dose is inadequate to treat such concurrent illnesses as pneumonia or meningitis.

a. *Dosage*

Although other routines of administration may prove satisfactory, the following schedules are suggested:

200,000 to 250,000 units two times daily is recommended. Since penicillin is best absorbed on an empty stomach, the time of administration should be ½ to 1 hour before a meal or at bedtime. A single dose of 200,000 to 250,000 units before breakfast is less preferable.

b. *Toxic reactions*

(1) Urticaria

(2) Reactions similar to serum sickness—they include fever and joint pains and may be mistaken for rheumatic fever.

(3) Angioneurotic edema

Although many individuals who have had reactions to penicillin can subsequently take the drug without trouble, it is safer not to use penicillin, if the reaction has been severe and particularly if angioneurotic edema has occurred.

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ANNUAL MEETING AND SCIENTIFIC SESSIONS

The Twenty-Ninth Annual Meeting and the Twenty-Sixth Scientific Sessions of the American Heart Association will be held at the *Hotel Chelsea* in Atlantic City, N. J., *April 8-12, 1953*, immediately preceding the annual meeting of the American College of Physicians. All those desiring to attend should make room reservations at the earliest possible date. (The Hotel Chelsea is located on the Boardwalk at Morris Avenue, 5 short blocks *south* of the Convention Hall.) The Scientific Sessions will be held on Thursday, Friday, Saturday and Sunday, April 9, 10, 11 and 12.

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